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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Donn E. Gabrielson

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EXAMINER

CHOWDHURY, AFROZA Y

ART UNIT

PAPER NUMBER

2629

MAIL DATE

DELIVERY MODE

11/17/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Allowability	Application No.	Applicant(s)	
	10/821,198	GABRIELSON ET AL.	
	Examiner	Art Unit	
	AFROZA Y. CHOWDHURY	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/26/2009.
2. ☒ The allowed claim(s) is/are 1-8,21,24-26 and 45-52 now renumbered as 1-20.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____. |
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DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with **Nathan Rees** on **July 30, 2009**.

In the claims:

1. (Previously Amended) A method or providing pseudo gray levels between true gray levels on a color display, said method comprising:

determining a number of said true gray levels natively supported by said color display, wherein said true gray levels each correspond to all color drive settings for a pixel being equal value;

determining an increased number of gray levels desired to be available for display on said color display, wherein said increased number of gray levels includes said true gray levels and said pseudo gray levels, and wherein said increased number of gray levels is a multiple of said number of true gray levels natively supported by said color display;

receiving a number that identifies a level of said increased number of gray levels to be displayed at a select pixel;

dividing said received number by said multiple to compute a quotient;

selecting a true gray level of said true gray levels for the select pixel, said true gray level having each color drive setting for said pixel being equal to said quotient; and based on a remainder value obtained from said dividing, adjusting one or more of said color drive settings of said select pixel to set the select pixel to one of the pseudo gray levels, wherein said pseudo gray level will be perceived as falling between two of said true gray levels.

2. (Original) The method of claim 1 wherein said one or more drive settings of said pixel are adjusted by one level.

3. (Original) The method of claim 1 wherein there are three drive settings for said pixel.

4. (Original) The method of claim 3 wherein one drive setting differs from the other two drive settings by one level.

5. (Original) The method of claim 4 wherein said three drive settings are red, green and blue.

6. (Original) The method of claim 5 wherein said red drive setting is adjusted.

7. (Original) The method of claim 5 wherein said green drive setting is adjusted.

8. (Original) The method of claim 5 wherein said red drive setting and said green drive setting are adjusted.

9-20. (Cancelled by Examiner).

21. (Previously Amended) A method of enhancing gray scales on a color display, wherein a plurality of color drive settings are used for outputting a pixel, said method comprising:

capturing an image to be represented as multiple shades of gray; and
mapping said multiple shades of gray of said image to provide a depth of gray levels for a pixel beyond what is available in true gray scale on said color display, wherein said true gray scale comprises a plurality of gray levels that each correspond to all of said color drive settings for said pixel being equal value, and wherein said mapping comprises:

determining a number of gray levels in said true gray scale;
determining an increased number of gray levels desired to be available for display on said color display to provide said depth, wherein said increased number of levels includes said gray levels of said true gray scale and pseudo gray levels that are perceivable as falling between two levels of said true gray scale;

receiving for said pixel in said image, a number that identifies a level of said increased number of gray levels to be displayed at said pixel;

dividing said received number by a ratio of said increased number of gray levels to said number of gray levels in said true gray scale to compute a quotient:

selecting a gray level of said true gray scale for the pixel said selected gray level having each of said plurality of color drive settings for said pixel being equal to said quotient; and

based on a remainder value obtained from said dividing, adjusting one or more of said color drive settings of said pixel to set the select pixel to one of the pseudo gray levels.

22. (Previously Canceled)

23. (Previously Canceled)

24. (Previously Amended) The method of claim 21 wherein said plurality of color drive settings comprise three drive settings.

25. (Original) The method of claim 24 wherein said three drive settings are red, green and blue.

26. (Original) The method of claim 25, said method further comprising: adjusting said three drive settings based on the level of brightness needed for display.

27-44. (Cancelled by Examiner).

45. (Previously Added) A method of enhancing gray scale output on a color display, said method comprising:

determining a number of true gray levels natively supported by said color display', wherein said true gray levels each correspond to all color drive settings for a pixel being equal value;

determining a desired number of gray levels to be available for display on said color display, wherein said desired number of gray levels is greater than said number of true gray levels natively supported by said color display and wherein said desired number of gray levels is a multiple of said number of true gray levels natively supported by said color display;

receiving a number that identifies a level of said desired number of gray levels to be displayed at a select pixel;

dividing said received number by said multiple to compute a quotient, wherein said quotient provides a preliminary value for each of the color drive settings for the select pixel;

based on a remainder obtained from said dividing, determining an adjustment to said preliminary value tier at least one of the color drive settings for the select pixel; and using said color drive settings to output the select pixel on said color display.

46. (Previously Added) The method of claim 45 wherein said color drive settings comprise red, green, and blue drive settings, and wherein the method further comprising:

when said remainder is zero, determining no adjustment to be made to said preliminary value of any of the color drive settings for the select pixel;

when said remainder is a first non-zero value, determining an increase in intensity of said red or blue drive setting;

when said remainder is second non-zero value, determining an increase in intensity of said green drive setting; and

when said remainder is a third non-zero value, determining an increase in intensity of said green drive setting and an increase in intensity of one of said red and blue drive setting.

47. (Previously Added) The method of claim 45 wherein said multiple is four.

48. (Previously Added) The method of claim 47 wherein said number of true gray levels natively supported by said color display is 64, and wherein said desired number of gray levels to be available for display on said color display is 256.

49. (Previously Added) A method of enhancing gray scale output on a color display, said method comprising:

determining a number of true gray levels natively supported by said color display, wherein said true gray levels each correspond to all color drive settings for a pixel being equal value;

determining a desired number of gray levels to be available for display on said color display, wherein said desired number of gray levels is greater than said number of true gray levels natively supported by said color display;

receiving a number that identifies a level of said desired number of gray levels to be displayed at a pixel;

dividing said received number by a ratio of said desired number of gray levels to said number of true gray levels natively supported by said color display to compute a quotient, wherein said quotient provides a preliminary value for each of the color drive settings for the select pixel;

when a remainder obtained from said dividing is zero, setting each of the color drive settings to the preliminary value for outputting the select pixel; and

when said remainder obtained from said dividing is non-zero, adjusting said preliminary value for at least one of the color drive settings for outputting the select pixel.

50. (Previously Added) The method of claim 49 wherein said color drive settings comprise red, green, and blue drive settings, and wherein the method further comprising:

when said remainder is a first non-zero value, determining an increase in intensity of said red or blue drive setting;

when said remainder is second non-zero value, determining an increase in intensity of said green drive setting; and

when said remainder is a third non-zero value, determining an increase in intensity of said green drive setting and an increase in intensity of one of said red and blue drive setting.

51. (Previously Added) The method of claim 49 wherein said ratio is 4/1.

52. (Previously Added) The method of claim 51 wherein said number of true gray levels natively supported by said color display is 64, and wherein said desired number of gray levels to be available tot display on said color display is 256.

Allowable Subject Matter

2. Claims 1-8, 21, 24-26, and 45-52 are allowed.

3. The following is an examiner's statement of reasons for allowance:

The cited references have failed to teach applicant's claimed invention,

“determining an increased number of gray levels desired to be available for display on said color display, wherein said increased number of gray levels includes said true gray levels and said pseudo gray levels, and wherein said increased number of gray levels is a multiple of said number of true gray levels natively supported by said color display;

receiving a number that identifies a level of said increased number of gray levels to be displayed at a select pixel;

dividing said received number by said multiple to compute a quotient;

selecting a true gray level of said true gray levels for the select pixel, said true gray level having each color drive setting for said pixel being equal to said quotient; and

based on a remainder value obtained from said dividing, adjusting one or more of said color drive settings of said select pixel to set the select pixel to one of the pseudo gray levels, wherein said pseudo gray level will be perceived as falling between two of said true gray levels” in combination with other limitations of claim 1, 21, 45, and 49.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AFROZA Y. CHOWDHURY whose telephone number is (571)270-1543. The examiner can normally be reached on 7:30-5:00 EST, 5/4/9.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
11/5/2009

/Bipin Shalwala/
Supervisory Patent Examiner, Art
Unit 2629